Phytologia (October 1992) 73(4):312-317.

TAXONOMIC NOTES ON CALIFORNIA SPECIES OF *CIRSIUM* (ASTERACEAE: CARDUEAE)

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ABSTRACT

Three new combinations are proposed for taxa of *Cirsium* occurring in California: **Cirsium douglasii** var. **breweri**, **C. fontinale** var. **campylon**, and **C. occidentale** var. **californicum**.

KEY WORDS: *Cirsium*, Asteraceae, Cardueae, California

In preparation of our treatment of *Cirsium* for the Jepson Manual, the new identification manual for California plants, we encountered three instances where the results of our investigation necessitate nomenclatural changes.

Cirsium douglasii DC. comprises two races. A long spined race with deeply divided leaves occurs in the California Coast Ranges and along the coast from Monterey County northward. A comparatively short spined race with more shallowly lobed or unlobed leaves occurs from the northern North Coast Ranges to the Modoc Plateau of northern California and southern Oregon and the northern Sierra Nevada. Howell (1959) treated the Coast Range race as var. *douglasii* and the interior race as var. *canescens* (Petrak) J.T. Howell, the latter based on *C. breweri* Jepson var. *canescens* Petrak. Cronquist (in press; pers. comm.) pointed out that although Howell's treatment was in accord with the *International Code of Botanical Nomenclature* then in effect (Lanjouw & Stafleu 1956), the present Code (Greuter *et al.* 1988) gives priority at the varietal level to the epithet, *breweri*, an automatic tautonym created when Petrak

published var. *douglasii*. Cronquist (in press) chose not to make the new combination for the interior race of *C. douglasii*. We plan to recognize this taxon for our treatment of *Cirsium* in the Jepson Manual and therefore propose the following new combination.

Cirsium douglasii DC. var. **breweri** (A. Gray) Keil & C. Turner, *comb. nov.* BASIONYM: *Cirsium breweri* Jepson var. *breweri* [autonym created by publication of *Cirsium breweri* Jepson var. *canescens* Petrak, Beih. Bot. Centralbl. 35(2):462. 1917. *Cnicus breweri* A. Gray, Proc. Amer. Acad. Arts 10:43. 1874. *Carduus breweri* (A. Gray) E. Greene, Proc. Acad. Nat. Sci. Philadelphia 44:363. 1893 (1892). *Cirsium breweri* (A. Gray) Jepson, *Fl. W. Middle Calif.* 507. 1901.

Cirsium douglasii DC. var. *canescens* (Petrak) J.T. Howell, Leafl. W. Bot. 9:11. 1959. BASIONYM: *Cirsium breweri* Jepson var. *canescens* Petrak, Beih. Bot. Centralbl. 35(2):462. 1917.

Cirsium campylon H.K. Sharsm. and *Cirsium fontinale* E. Greene comprise *Cirsium* sect. *Dermatolepis* Petrak (Sharsmith 1939). The former occurs in the eastern portions of the San Francisco Bay area. The latter has been treated as comprising two disjunct races: var. *fontinale* from San Mateo County in the southwestern San Francisco Bay region, and var. *obispoense* J.T. Howell, disjunct ca. 200 km to the south in San Luis Obispo County. All three taxa are rare endemics of wet serpentine soils. Pilz (1967) investigated the relationships and variation among the three taxa and concluded that *C. campylon* is actually more similar to *C. fontinale* var. *obispoense* than the latter is to var. *fontinale*. All three taxa are clearly very closely related. Pilz proposed to treat *C. campylon* as a variety of *C. fontinale*, a decision with which we concur. Pilz' study, however, was never published. We plan to treat *C. campylon* as a variety of *C. fontinale* in our treatment of *Cirsium* in the Jepson Manual and therefore propose the following new combination:

Cirsium fontinale E. Greene var. **campylon** (H.K. Sharsm.) Pilz *ex* Keil & C. Turner, *comb. nov.* BASIONYM: *Cirsium campylon* H.K. Sharsm., Madroño 5:85. 1939.

Cirsium occidentale (Nutt.) Jepson is part of a complex of incompletely differentiated and variable races that have been variously treated in the past. Jepson (1925) recognized *C. occidentale* with four varieties: var. *occidentale* of the coast and outer coast ranges from San Diego to Mendocino counties, var. *coulteri* (Harv. & A. Gray) Jepson of mountain slopes of the South Coast Ranges and Sierra Nevada, var. *venustum* (E. Greene) Jepson of the inner

North Coast Ranges, and var. *candidissimum* Macbr. with a northern distribution from the northern North Coast Ranges to the Modoc Plateau of California and adjacent Nevada. He treated *C. californicum* A. Gray, comprising plants of the South Coast Ranges, southern California mountains, and the Sierra Nevada, as a separate species.

Howell (1943, 1959, 1960) treated the various entities of this complex as species. He recognized *Cirsium occidentale* as a species without infraspecific taxa. Because of a nomenclatural conflict at the species level, Howell (1943) renamed var. *candidissimum* as *Cirsium pastoris* J. T. Howell (a *nomen novum*). Howell chose to combine the taxa treated by Jepson as vars. *coulteri* and *venustum* as a single species without varieties. However, no name was available for the combined taxon at the species level. After examination of types, Howell determined that *C. coulteri* Harv. & A. Gray, the basionym of var. *coulteri*, is taxonomically synonymous with *C. occidentale* [var. *occidentale*]. The epithet *venustum* could not be used at the species level for this taxon because its use would create a later homonym. Therefore, Howell (1959) proposed *C. proteanum* J.T. Howell as a *nomen novum* for the plants. Howell (1960) and other workers (Moore & Frankton 1963; Munz 1959, 1974; Ownbey & Hsi 1969; Ownbey *et al.* 1975) have continued to recognize *C. californicum* as a distinct species. However, Howell's concept of *C. californicum* apparently included some variants treated by Jepson as *C. occidentale* var. *coulteri*. This is nowhere explicitly stated, but it is evident from specimen determinations that Howell's concept of *C. californicum* encompassed some of the variation included by Jepson in *C. occidentale* var. *coulteri*.

Wells (1983) investigated hybridization and recombination in a series of sites along Happy Canyon Road in the San Rafael Mountains of Santa Barbara Co., California, involving what he described as *Cirsium occidentale* and *C. californicum*.. It is evident from his descriptions of the plants and from collections made in the vicinity of the hybrid populations that Wells' *C. occidentale* is the taxon Jepson had treated as *C. occidentale* var. *coulteri* and that Howell had called *C. proteanum*. Wells investigated the populations using morphology, seed protein electrophoresis, pollen fertility, and ovule development in controlled crosses, and analyzed data using principal coordinate analyses and other morphometric techniques. He concluded that: "the Happy Canyon *Cirsium* population consists of one biological species with no sterility barriers; morphological and electrophoretic phenotypes correlated with habitat type appear to have a genetic basis; and that differentiation corresponding to habitat types suggests that several phenotypic traits may be subject to selection and that differentiation along new lines may have resulted after hybridization of *C. californicum* and *C. occidentale* in the Happy Canyon population."

Examination by the senior author of hundreds of herbarium specimens from California herbaria of the taxa involved and field investigations in the South Coast Ranges and western Transverse Ranges of Monterey, San Luis

Obispo, Santa Barbara, Ventura, and western Kern counties have revealed that the intergradation investigated by Wells is by no means a unique occurrence. Although isolated populations of these thistles may be well differentiated, the taxa co-occur in various areas, and where they are sympatric the recombination of morphological characteristics is as impressive as that observed by Wells.

The extent to which intergradation of these taxa is historical as well as modern is difficult to determine. Roadsides are among the most common habitats where thistles grow and from which many collections have been made. Construction of roads, fire breaks, etc., have provided disturbance corridors along which thistles have extended their ranges. This may have allowed previously isolated and differentiated populations to merge and intergrade. Data are inadequate, however, to document or refute this hypothesis. Most thistle collections, unfortunately, are just individual plants–understandable in view of the vicious nature and size of the plants involved. Label data seldom record the variation within populations from which individual plants were gathered. Assignment of some historical, as well as recent, collections to one or the other taxon is difficult; apparent character conflicts or overlap may represent past intergradation or merely within taxon variation.

In our treatment of *Cirsium* for the Jepson Manual we intend to recognize these and other members of the *C. occidentale* complex (*sensu lato*) as a single highly variable species that includes *C. californicum*. Names exist in *C. occidentale* at the varietal level for four of the five taxa we intend to recognize: var. *candidissimum*, var. *compactum* Hoover, var. *occidentale*, and var. *venustum*. Because *C. californicum* has never before been merged with *C. occidentale*, we propose the following combination:

Cirsium occidentale (Nutt.) Jepson var. **californicum** (A. Gray) Keil & C. Turner, *comb. nov.* BASIONYM: *Cirsium californicum* A. Gray, Pacific Railroad Report 4:112. 1856.

ACKNOWLEDGMENTS

We thank Dr. Rhonda L. Riggins and Dr. Donald J. Pinkava for their comments and review of this manuscript, and the staffs of CAS, DS, HUM, JEPS, POM, RSA, SD, UC, and UCSB for loan of specimens. The late Dr. Arthur Cronquist made helpful comments in an early phase of this project and made available his unpublished manuscript on *Cirsium* for the Intermountain Flora. The senior author thanks Ms. Patricia Barlow for making available copies of her extensive literature review on *Cirsium* during the initial stages of this study and for her insightful comments and discussion.

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